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AN EVALUATION OF RODENT PROBLEMS IN THE NORTH SHORE CAMPGROUND, ARROWHEAD RANGER DISTRICT, SAN BERNARDINO NATIONAL FOREST

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ABSTRACT

The North Shore Campground was examined to assess rodent problems and to suggest feasible alternatives for managing rodent problems. Burrowing activity by ground squirrels has caused erosion, damage to roads, and loss of vegetation. The high number of squirrels also increases the potential for transmission of plague and other diseases to campground users. Pocket gophers also are evident in most areas of the campground. The establishment of screening vegetation and regeneration probably will be unsuccessful without rodent control. Management options for controlling ground squirrels and pocket gophers are presented.

INTRODUCTION

The North Shore Campground was examined on December 14, 1981 by Jim Bridges, Forest Silviculturist, Joel Strong, District Recreation Officer, and John Borrecco, Animal Damage Specialist, Fisheries and Wildlife Management Staff (F&WL), RO.

A silvicultural prescription for the campground identifies the need for establishing screening vegetation between campsites and along roads and for providing regeneration for future shade trees. Pest problems also were recognized as a major limitation to achieving the objectives. Insect and disease problems were evaluated by members of the Forest Pest Management Staff (Report No. 81-38). The objectives of the examination were to assess rodent problems in the campground and to suggest feasible alternatives for controlling or preventing rodent problems.

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OBSERVATIONS

The major vertebrate pest in the campground is the ground squirrel (Spermophilus beecheyi). Ground squirrels were hibernating when the examination was made but old evidence of extensive burrowing activity was abundant around most campsites. Undermining of tree roots, roads, and other structures was observed. Burrowing activity has already resulted in erosion, damage to roads, and loss of vegetation. Reports on the high number of ground squirrels seen during periods when they are active also indicate a high potential hazard exists for transmission of plague and other diseases to campground users.

Fresh pocket gopher mounds and plugs were evident in most areas of the campground. Evidence of both ground squirrels and pocket gophers was particularly heavy in the area near units 14 through 17.

BIOLOGY OF VERTEBRATE PESTS

GROUND SQUIRREL (Spermophilus beecheyi)

Ground squirrels are found in a wide variety of natural habitats but are particularly abundant in man-disturbed areas like campgrounds. They are active during the day and can often be seen from spring through fall, especially in warm, sunny weather. Ground squirrels live in groups or colonies and spend much time in their burrows where they sleep, rest, rear young, store food, and escape danger. They do not feed in their burrows and they do not plug burrow entrances.

During winter months most ground squirrels hibernate, and most adult squirrels also estivate (summer hibernation) during the hottest parts of the year. Ground squirrels emerge from hibernation in late winter or early spring depending on local environmental conditions. Adult squirrels are primarily active during the spring and fall; juveniles are active throughout the summer and fall. Ground squirrels breed in early spring shortly after coming out of hibernation. Litter sizes average 7 to 8 young, and young animals become active above ground about 6 weeks after birth.

Ground squirrels are primarily vegetation eaters, but the type of vegetation consumed changes with the seasons. In early spring their diet consists mostly of green material such as grasses, forbs or leaves of shrubs. When the vegetation begins to dry, squirrels switch to eating seeds and begin to store food.

POCKET GOPHER (Thomomys bottae)

Pocket gophers live in closed burrow systems and spend most of their time below ground. The crescent-shaped mounds and plugged burrow entrances are major signs of gopher presence and activity. These animals are solitary except

during the breeding season and when young are being raised. Pocket gophers eat succulent underground parts of plants, although they may graze aboveground on plants near burrow openings. Breeding occurs in early spring when green forage is plentiful, and litters of 4 to 8 young are born after a gestation period of 18 to 19 days. An annual turnover of more than 75 percent of the population is common. Young disperse, usually aboveground, in late summer. Mound-building activity is most common during the late summer or early fall when young are dispersing and establishing their own burrows and adults are enlarging their systems in preparation for winter. Pocket gophers are active year round and even burrow through snow. Where preferred forbs and grasses are lacking, pocket gophers may feed on the roots of large trees.

MANAGEMENT OPTIONS

GROUND SQUIRREL

1. No Action. Failure to reduce ground squirrel numbers to acceptable levels (1 squirrel per 2-3 campsites or 2-3 squirrels per acre) will result in continued damage to roads, vegetation and other campground facilities from burrowing and feeding activities. High population levels will prevent successful establishment of vegetation in open areas. High numbers of squirrels increase the potential for contact between squirrels and campers and increase the hazard of plague being transmitted to campground users.

2. Direct Control. Control efforts should be based on ground squirrel activity and feeding habits. The major effort should be directed at bringing population levels within manageable levels. Annual maintenance will probably be necessary to keep populations at acceptable levels. No control method is effective when squirrels are in hibernation or estivation.

a. Fumigants. Fumigants like methyl bromide, carbon bisulfide, and gas cartridges are recommended during the spring breeding season when soil moisture is high and grain baits are often poorly accepted. Fumigants are not practical for large-scale control efforts due to the expense and labor involved. The easiest fumigant to use is the gas cartridge. A lit cartridge is placed in each active burrow opening and the opening is closed with soil. Control effectiveness of 60 to 70 percent is common. Some follow-up control will probably be needed. Cartridges cost about $.25 each and costs of application depend largely on the number of active burrow openings per acre. There is no secondary-poisoning hazard from using the gas cartridge, and the gases do not persist or accumulate in the environment or in animal tissues.

b. Baiting. Toxic grain baits are recommended during the summer and fall when animals are active and feeding on seeds. Occasionally grain baits may be accepted during the breeding period (February - April), in which case adequate control might be obtained with spring baiting.

Acute toxicants (single-dose) like zinc phosphide and strychnine have an advantage where a quick reduction in animal numbers is needed. The campground should be closed when applying acute toxicants. Unless there is good acceptance of baits in early spring, these baits would probably be used only in the

fall after closure of the campground and before animals go into hibernation. One disadvantage of using acute toxicants in that bait shyness may develop. To reduce the potential for bait shyness, a given acute toxicant should not be applied more than once a year.

Anticoagulants (multiple-dose) like diphacinone and chlorophacinone are more expensive to use than acute toxicants, but the safety to humans and nontarget species and their efficacy make the anticoagulant baits an attractive alternative. These baits can be applied by either scattering the bait near active burrows or by placing the bait in bait boxes distributed in areas frequented by the ground squirrels.

Scattered bait would need to be applied at least every other day so that an uninterrupted supply of bait would be available for 6 to 8 days. Bait should not be placed in piles and this application method should not be used when the campground is open. Bait boxes offer good protection to children and pets and they could be used safely when the campground is in use if they are locked and properly maintained. Bait boxes must be inspected often and a constant supply of bait maintained until squirrels are no longer seen. This application method requires 2 to 4 weeks of treatment to be effective. Squirrels must feed on the baits for 5 days or more without any gaps of more than 48 hours. Since ground squirrels do not feed in their burrows, baits should not be placed in burrows.

All toxicants have secondary-poisoning and nontarget hazards associated with their use. These hazards can be mitigated by proper application, use of bait boxes, and disposal of any dead animals found above ground.

c. Trapping. Trapping can be used during any period when squirrels are active but is practical only in small areas where the number of squirrels to be controlled is not great, or as a follow-up to other control methods. After populations have been reduced to acceptable levels, trapping could be used in an annual maintenance program to keep levels manageable. Hazards to nontarget animals like small pets exist, and the necessity to handle animals subjects personnel to plague and other disease hazards.

POCKET GOPHER

1. No Action. Pocket gopher numbers will likely increase. This increased activity along with that of ground squirrels will prevent successful establishment of vegetation in open areas. Loss of additional large trees also is possible.

2. Trapping. Trapping is extremely time consuming and is practical only on small areas or as a supplement to other forms of control. It should also be effective for animal maintenance after initial control efforts.

3. Fumigation. The extent of the burrow system and the ability of gophers to plug off their burrows make the use of gas unsatisfactory and relatively expensive.

4. Baiting. Use of a mechanical burrow builder in the campground is probably not practical. Hand baiting with strychnine-treated grain bait placed in gopher burrows is the most practical and effective method of direct control. Control is most effective when there is fresh mound-building activity and when soil moisture is adequate to prevent collapse of the burrows. These conditions usually occur during late fall and early spring. The ability to irrigate in the campground would make control possible anytime fresh activity occurs. Average costs for gopher baiting on the San Bernardino National Forest are $17 to $22 per acre. This method could be safely used when the campground is open but would probably be best used when the campground is closed. Since the bait is placed underground and most gophers die in the burrow system, secondary-poisoning and nontarget hazards are minimal.

5. Physical Barriers. Individual seedling protectors like "Vexar" have provided short-term protection to coniferous seedlings. However, long-term efficacy and effects on trees are still under study. Physical barriers will not prevent damage to established trees and shrubs. This approach is most effective when integrated with other control methods.

6. Habitat Manipulation. Control of vegetation is not consistent with management objectives for the campground. Maintenance of dense shrub cover around edges of the campground and along roads should help reduce the favorablness and amount of gopher habitat and delay reinvasion from areas outside the campground.

An integrated approach of suppression and prevention using knowledge of the ecology and behavior of the animals as well as information on the methods available is needed for successful management of rodents and accomplishment of silvicultural and recreation objectives. An annual maintenance program of rodent control should also be planned for in the long-term management of the campground.

If you have any question concerning the evaluation or require additional information or assistance, including training of personnel in the proper application of control methods, please contact the F&WL or FPM Staffs.